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NEWS ON 4

YS TO CLOSE

As we go to press the news has just been confirmed that Your Sinclair is to cease publishing with the August issue which they promise will be a bumper one. When, some time ago, I hinted that one of the glossies was closing it was YS that I was talking about - it was saved for a few extra months of life by the closure of Sinclair User.

Sales have dropped from over 80,000 at the mags height back in 1986 down to just over 20,000 today. YS has suffered from very poor distribution for the last 18 months or so.

This now leaves FORMAT as the only paper based magazine on the market for Spectrum and Sam owners.

MENZIES DROPS COMPUTERS

Just months after dropping other hardware to concentrate on the Amiga the giant high street chain John Menzies have pulled the plug on selling computers. Their spokesman said "Sales have dropped dramatically over the last 12 months". One source also told FORMAT that the high level of returns and recent software compatibility problems had led to a review on how to improve profit per shelf space.

Once existing stocks are exhausted Menzies will concentrate on selling software.

REVELATION PROGRAMMERS

Exeter based Revelation Software has set mid September for a launch of 'reasonably priced' disc based games for the Spectrum. DISCIPLE/PLUS D disc versions will spearhead their move but Revelation say that 3" discs for the +3 will follow if the demand is there.

At the same time as announcing these plans Revelation also launched a

search for new games (Spectrum and Sam). Programmers who hold the rights to games (even if they may have been published once before) should send samples to Revelation.

SD GETS WED

Nev Young, boss of northern software company SD Software and ex writer of FORMAT's Help Page, has staged a successful merger.

On the 19th June, in front of family and friends (and with Bob Brenchley at his side) he pledged his love and devotion to Clarice and took her hand in marriage. Why he would just want her hand is not clear - but Nev always has been a bit funny (ha-ha or peculiar - take your pick).

Anyway FORMAT sent a press team of reporter and photographer to cover this industry event of the year so we thought we had better put something in this issue, just to justify expenses.



URGENT we need your news. Anything you think other people should know about. Items printed earn contributor 3 months extra subscription (please claim when renewing).

The Editor Speaks

Lots of congratulations to be handed out this month. First my son Darren got married on the 29th May. So I can congratulate myself on acquiring my first daughter-in-law, Claire (and as I only have one son I'm not expecting to acquire any more). Then on the 17th June my daughter Annemarie reached the ripe old age of 18. Don't the years fly...

More congrats are also in order this month for Nev Young and his new bride Clarice. I had the honour of being Nev's best man, an experience I will long remember. I'm sure you will all join me in wishing the happy couple long life and prosperity. [And now the wedding is over with Nev, how about a few more articles from you.]

All this has meant that I was forced to neglect the evening hotline service quite a bit during May and June. Sorry to everyone who rang in only to find the answer-phone on, service is now back to normal with the evening line open most days from 7.30 to 9.30 pm.

This month we have the pleasure of including West Coast's second news letter for Sam owners. Because of the high cost of producing these mail shots (the first one cost West Coast over £1000 even after selling ad-space in the mailshot) this will be the last. In future West Coast will use the quarterly mail shot we do to our Associate Members, together with the matching issue of FORMAT, to pass on their news. As FORMAT subscribers you therefore need to do nothing to continue receiving West Coast info, you will get it automatically.

On the subject of Associate Members, many of you will have seen the advert we were lucky enough to get into the last issue of Sinclair User and the ads we currently have running in Your

Sinclair. Several readers have phoned to ask "What are we missing out on." Answer - NOTHING. Associate members get a small newsletter (made up from the news items in FORMAT) and advertising material. They have to pay the full price (£1.25 + p&p) for any FORMATS they buy while you get them for £12 per year. Access to our famed technical support is also limited to the daytime. Everything they get you get more of and quicker, the whole idea of Associate Membership is to convert them to full Members and therefore FORMAT readers.

Now I know it may seem early to be thinking about Christmas, especially as the temperature in the office at the moment is well into the eighties. However, I want to give ample time for all you programmers to get your fingers out and write something for the December issue of FORMAT. I am looking from everything from a main-feature article to lots of Christmassy items for the Short Spot. I'm also in need of any cartoons you can come up with. Often my appeal has not produced much of a reply because I have made it too late so this time - you've had plenty of warning - I expect to see some good stuff.

We will, in the next few months, be moving to full DTP production here at FORMAT. This move, which we have been planning for some time, will enable us to improve the presentation and speed up the production side. Because of this I would ask anyone who submitted articles for FORMAT before January of this year to get in contact if your article has not been published yet. I know there is a fair amount of material that has been overlooked but it will be difficult to sift through without your help.

Bob Brenchley, Editor.

SD Software

SPECTRUM UNIDOS PC-SUITE

UNIDOS Version 2 of the incredible new DOS from Steve Warr for the PLUS D and DISCIPLE. Same DOS file for both systems. Random files. Sub directories. Hundreds of files on one disk. Hidden files. Protected files. Copy files of any length. Incredibly versatile screen dump routines. Error trapping. Many more features. Compatible with all Spectrums*. Over 20 programs now included on the disk. * +2A/+3 restricted to 48K mode.

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PC-Suite. From the author of SPECMAKER S.D. Software brings you PC-SUITE. Now you can transfer your IBM data files by reading and writing IBM disks on your Sam. PC-Suite will let you format IBM disks on Sam. Write Sam basic programs on your PC(A). Use PC-Suite to copy Sam data files to PC disk and print them on a high quality laser printer. Many more uses.

nb. Not a PC emulator.

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SHORT SPOT

YOUR HINTS, TIPS AND PROGRAMMING IDEAS

Edited By:- John Wase.

I've got some REAL short spots for you this month. First off is Mr L.G. Baumann of Cowies Hill, South Africa. He writes that while he was idly programming the other day, he was thinking that there must be many of us who have developed little gimmicks which seemed unimportant at the time, but which are really incredibly useful: and we've never thought to pass them on, believing them to be unimportant. Here's three.

When you program your Speccy in BASIC, always add a REM note to the GOSUB to say what the subroutine does. Like this...

250 GOSUB 6510: REM to calculate size

That's fine - up to a point. You've got a long Basic program with lots of subroutines. One of them gets to a RETURN. Where's it going now? Well, you can ease things with a reference in the RETURN line. Then if you pick up the program after several years on the shelf, you still know what it's all about. Hang on, though. There's a snag in the dish. If you just use a simple REM statement, any re-numbering program will ignore it. So...just use Mr Baumann's work-around. Enter the RETURN line as follows...

7050 RETURN : STOP : GOSUB 250: GOSUB
5340: GOSUB 7940: REM

The instructions from STOP onwards are not reached when the program is run; the STOP prevents that, but a renumbering program will change them as well as everything else. Great stuff; this is often the most difficult part of the job - to fathom where the loops are going, particularly if the program is being developed, and you've not been too meticulous in writing the code. But that's not all. For a quickie

reference, and to avoid having to print the thing out all the time, the piece of the line from STOP to REM inclusive is highlighted in yellow. I know that I know how to colour a line; unless you're new to programming, you know it too. It's not the ability, it's the way it's applied to solve a problem. You just pick out all the yellow highlighted lines on-screen. Wonderful. Wazzatt? How d'you do it? Well, after RETURN, press Capshift with Symbolshift followed by 6. At the end of the line, Capshift and Symbolshift are used with 7 to change the listing back to normal. And those imbedded colour codes are retained when you save the listing, too.

Wonderful stuff, Mr Baumann. Please do send some more; they're just what we're looking for.

Funny I should say that, for Roy Burford of Stourbridge, West Midlands, has also sent some real short spots. Bless you, Roy. As anyone knows, on power-up, the Spectrum allocates some of its RAM to various bits and pieces, like the screen, printer buffer, streams and channels and variables. This list grows with your program, which consequently gets pushed up and down with the tide. At the other end, you're pouring in assembled code, and moving RAMTOP down to accommodate and protect it. And between RAMTOP and the end of the BASIC program, there's a space. Well, you hope there is. You need some room for manoeuvre here, as I found to my cost when using a Discovery many years ago. I had inadvertently filled this space up to the brim with a program. I ran it from time to time, and eventually saved the listing. By this time, the variables area was choc-a-bloc. When I came to load it again, space was allocated in such a way that it wouldn't quite completely load; well it just locked

solid with the disc still spinning, if I remember. Roy's been reading Ian Logan and Frank O'Hara's ROM disassembly book, where he's come across a short-cut method of finding the amount of free space. It's so easy, just type in the Basic command: PRINT 65536-USR 7962, and there you are. This little gem makes use of the "Free Memory" subroutine in the Spectrum ROM at location 7962 (1F1A hex). Nice one.

Next, a moan and a warning. Those of you who read "Micro Computer Mart" could well have noticed an article by me on bum discs. At the moment, there is a shortage of discs, and unscrupulous vendors have got hold of rejects which are absolutely useless and are passing them off as good discs. These are usually format rejects from software duplicators. In particular, there is one appalling batch around of high density discs, light buff in colour, with incised numbers on the back. I am told that they're Verbatim rejects. The bulk of these won't even format track zero, so they're utterly, totally U.S., except as beer mats or gliders for the fridge. I speak with feeling, as I was one of those lumbered - I bought 150 of them at the "Computer Shopper Show". I also bought discs with a few bad sectors from "Just Discs" at the "All Formats". They are reputable, and are immediately replacing them (dealers can be "done", too). At the last "All Formats", I bought from Manor Court; they've been in the business for 10 years and can't afford to sell dodgy recording media. I would recommend either buying from a dealer you know and trust, or one of the two I mentioned until the shortage is over. And that is unlikely to be until after Christmas. Er... Anyone want a 150 useless discs? Going cheap.

Let's go with SAM a little. Poor SAM, been neglecting him. Roy Gardner of Leytonstone, London, hasn't. He so liked the simulated virus program that he wrote his own. All "Dot" does is to convert a displayed ASCII character into the next. Well, this is guaranteed to make a super muddle of

any text if left long enough, for it goes round and round and round. Fortunately for the de-encrypters, Roy's included the ability to return to the original, as well. Insert any text instead of the "LIST" statement in Line 10.

```

5 REM CNS&ax&&Qnx&ff&qc&dq&8&
7 REM Omit lines 50-55 & you have a
  simple code program After scram
  bling, pressSPACE & the origin
  al text is eventually returned.
  Scramble any no. of times.
10 LIST 5 TO 50: LET z=0
15 LET a=0,b=0,c=1,dt$="DOT "
20 POKE 21824,60,126,255,255,255,25
  5,126,60
30 LET s$=SCREEN$(a,b),s$=CHR$(COD
  E s$+1): IF z THEN LET s$=CHR$(
  CODE s$-2)
40 PRINT AT a,b: PEN 15:CHR$ 150: I
  F CODE s$<>33 THEN GOTO 60
50 LET s$=dt$(c),c=c+1: IF c=5 THEN
  LET c=1
55 PRINT AT a,b: PEN 6:s$: GOTO 70
60 PRINT AT a,b:s$
70 LET b=b+1: IF b=31 THEN LET b=1,
  a=a+1: IF a=19 THEN GOTO 90
80 GOTO 30
90 PAUSE 500: IF INKEY$=" " THEN LE
  T z=1
95 GOTO 15

```

Roy also includes a little program to show the status of certain SAM parameters. MERGE the routine with any program and include the line GOTO 6E4, when it displays free memory, Ramtop and other similar information. A line could be added at 60015 to PAUSE and then RETURN to the program being written. A very useful aid to finding out what is going on in memory.

```

60001 REM Memory Status
60002 PRINT "ROM chip version: ";
  PEEK 15/10;" ":(DPEEK &5cb4)
  +1)*(16384)/1024;"K"
60003 PRINT "ROM len:      24576
  "; " =24K"
60004 PRINT "ROM+BASIC+Free="; TAB 18
  ;RAMTOP: TAB 25;"=";INT (RAMTOP/
  1024);"K": PRINT
60005 PRINT "RAMTOP at:      ";RAM
  TOP;" (Page";INT (RAMTOP/16384)+
  1;" )"
60007 PRINT "FREE="; TAB 18;FREE: TAB

```

```

25;"=";INT (FREE/1024);"K"
60009 PRINT "BASIC len="; TAB 18;INT
  ((RAMTOP-FREE)-24576); TAB 25;"
  =" ;INT (((RAMTOP-FREE)-24576)/10
  24);"K"
60011 PRINT "((IN 252 BAND 31)+1)*163
  84;" =start of Screen 1"
60012 PRINT "Screen len=24576+16 Pale
  tte info"

```

You all remember the SAM colour comments of previous issues. They don't lie down and go away; I've had more stuff in. Like John Saunders of Chalfont St.Giles, Bucks. He writes that he, too, had found Chapter 5 of the SAM manual very difficult to understand. After some time, he realised that a good way of describing it was that palette has 16 blobs of paint. Any can be chosen at will. The instruction, "PALETTE n,col" deals with "the number you choose in the range 0 to 15 (n) to represent AND TAKE THE PLACE OF the number of the blob of colour you need (col) from the range on p66 of the manual". If this isn't any clearer, then the program below might throw a little more light on things.

```

10 CLS#: BORDER 5: FOR COL=17 TO 12
  7 STEP 5: REM any or no step as
  you please
20 INPUT "Palette no. ",N: REM rang
  e 0-15
30 PALETTE N,COL
40 PRINT PEN N;"***XXX***abcdABCD"
50 NEXT COL

```

This seems to work nearly all the time: the new colour (COL) washes over lines coming from a palette number (N) when that N number is repeated, which is the principle being followed in the infamous "Twirl" program. The result of choosing palette 0, 8 or 15 may be surprising, but it is logical; and note the change of display when N is given the value 5. This is very interesting, John, and I like the simple analogy. Unfortunately, I included some other stuff last month which probably explains some of the questions you raise, though I agree with you that there seem to be some puzzling anomalies at times.

But back to Roy Gardner. Roy here talks also about SAM's colour. Now we've sorted out PALETTE, let's have a look at the Line Interrupt function. Roy wrote this program to provide a simple column of colours, followed by a radiated display, using Line Interrupts, and helps to make their use reasonably clear. Roy can't claim originality or remember where he got it from. He's amended it a bit, so it's not quite the same, but hopes it didn't originate in FORMAT! So do I, Roy, or I'll get shouted at, too. So apologies if you wrote it, more apologies if you've seen it. Anyhow, have a go at it, and see what you think...

```

25 CSIZE 8,8
30 LET g=4,y=172
35 FOR c=1 TO 85
40 PALETTE 1,c LINE y
45 LET y=y-2,g=g+3
50 NEXT c
52 FOR f=0 TO 21: PRINT AT f,7: PEN
  1;" " : NEXT f
58 STOP
60 MODE 3: REM Plane
65 RESTORE 130
70 LET g=4,y=85
80 FOR c=1 TO 8
  ■ READ k
100 PALETTE 1,k LINE y
110 LET y=y-g,g=g+3
120 NEXT c
130 DATA 106,46,42,41,26,24,9,8
140 LET s=57
150 PEN 1
160 FOR x=0 TO 511 STEP s
170 PLOT 0,100: DRAW TO x,-18
180 PLOT 511,100: DRAW TO x,-18
190 NEXT x
200 FOR y=-18 TO 102 STEP .25*s
210 PLOT 0,100: DRAW TO 511,y
220 PLOT 511,100: DRAW TO 0,y
230 NEXT y
240 PLOT 0,100: DRAW 511,0

```

Mr Ross of Bridge of Weir, Renfrewshire, mentions that since our recent discussions of Maxprint Ink, an advert has appeared in "Computer Shopper" by Beach Imaging, 205 Glenesk Road, Eltham, London SE9 1RD, Tel 081 850 8344. They supplied a 90cc plastic bottle of black Maxprint ink for £14.39 including VAT, postage and

packing. Our thanks to you, Mr Ross. While I'm on the subject of printers and printing, I should also mention that ink jet printers are now surprisingly cheap, and are pretty good, though my experience of the Deskjet has been that you really need the special paper if you are to get crisp print. The Canon bubblejet is dearer, but achieves better results on plain photocopy paper. I've not tested the new Epson Stylus, though it looks pretty good. But, if you want the ultimate, bottom-end laser printers are now cheaper than my first Epson FX80 in real terms. Honestly if you do feel tempted, do ensure that you get one with an Epson Emulation mode. You can then use it direct with Spectrum or SAM and achieve some really stunning effects. Yes, I know some of you will blink twice when I talk about laser printers. But if you've not looked recently, well, the price has really come down.

Remember the program "Circlegrow" from February? Wouldn't work in 128k mode, would it. Well Roy Burford has modified it; so now it does!

```

1 REM Circle program by P.I.Berry.
  Popular Computing Weekly 22-28 Mar
  ch 1986.
2 REM Revised to ZX Spectrum 128K
  by B.C.R.Burford 110293. MC reass
  embled to run in 128K Basic.
4 IF PEEK 65200=221 AND PEEK 65232=
  5 AND PEEK 65272=201 THEN GOTO 48
5 CLEAR 65199
10 LET tot=0
11 FOR f=65200 TO 65200+72
20 READ a: LET tot=tot+a
30 POKE f,a
40 NEXT f
45 IF tot<>10261 THEN PRINT "Error i
  n data": STOP
48 POKE 23658,0
50 DEF FN c(x,y,r)=USR 65200
55 LET x=127
57 INPUT "Radius range? 20 to 200: "
  :rad
58 IF rad<20 OR rad>200 THEN GOTO 57
60 FOR r=1 TO rad STEP 1.2
70 LET x=x+(INKEY$="p")-(INKEY$="o")
80 LET l=FN c(x,87,INT r)
90 NEXT r
91 PRINT #0;"Finished, release keys:

```

```

": FOR d=0 TO 300: NEXT d
92 INPUT "Another one? y/n:";a$
93 IF a$<>"y" AND a$<>"n" THEN GOTO
  92
94 IF a$="y" THEN CLS : GOTO 48
95 STOP
100 DATA 221,42,11,92,221,110,4,221
110 DATA 102,12,221,70,20,14,0,80,203
  ,58,213,205,214
120 DATA 254,209,12,122,145,87,48,4,1
  22,128,87,5,120
130 DATA 185,48,237,201,205,217,254,1
  20,65,79,205
140 DATA 223,254,120,237,68,71,125,12
  9,212,235,254
150 DATA 125,145,216,197,79,229,124,1
  28,71,254,176
160 DATA 220,223,34,225,193,201

```

You know, it's a proper pain. I get a disc with four programs on, use two for a "Short Spot". Then I start writing the next. By this time, Bob's printed the previous one and maybe cut one of the programs to make it fit. Total chaos! Anyway, here's a "leftover" from Lee Willis of Wirral. Sorry Lee! He asks "...if I'm fed up with Big Character Programs for SAM yet?" No, Lee, and if you graduate to a Laser Printer, you can get wonderful effects. Here are the programs. The first makes a character set to be used by the second program.

```

10 MODE 4 : LET xos=0,xrg=256,yrg=1
  92,yos=0: CSIZE 8,8: DIM char$(9
  5,203)
20 POKE &5548,0,8,5,7,13,15,82,112,
  90,120,117,119,125,127,127,127
30 POKE &55ec,0,8,5,7,13,15,82,112,
  90,120,117,119,125,127,127,127
40 LET s$=""
50 FOR chr=33 TO 127: LET s$=s$+CHR
  $ chr: NEXT chr
60 LET cpos=1
70 DO
80 LET ys=170,xs=2
90 LET x=0,y=0: PEN 15
100 PRINT #0: AT 0,1;:s$(cpos)
110 IF POINT(8+x,0-y) THEN LET a=xs+
  (x*2),d=ys-(y*2): PLOT a,d: PLOT
  a+1,d: PLOT a+1,d-1: PLOT a,d-1
120 IF POINT(8+x,0-y) AND POINT(7+x,
  0-y-1) THEN PLOT a-1,d-1
130 IF POINT(8+x,0-y) AND POINT(9+x,
  0-y-1) THEN PLOT a+1,d-2
140 IF POINT(8+x,0-y) AND POINT(7+x,

```

```

  1-y) THEN PLOT a,d+1
150 IF POINT(8+x,0-y) AND POINT(9+x,
  1-y) THEN PLOT a+2,d
160 LET x=x+1: IF x=9 THEN LET y=y+1
  ,x=0: IF y<9 THEN PEN (17-y*2)
170 IF y<9 THEN GOTO 110
190 LET cpos=cpos+1
200 GRAB char$(cpos-1),xs=2,ys=2,20,
  20
210 CLS
220 LOOP WHILE cpos<=LEN s$
230 INPUT #2: AT 0,0;"SAVE FILE AS :
  ": LINE file$
240 SAVE file$ DATA char$( )

```

And now the program to us BIGCHRS.

```

10 MODE 4 : LET xos=0,xrg=256,yrg=1
  92,yos=0
20 POKE &5548,0,8,5,7,13,15,82,112,
  90,120,117,119,125,127,127,127
30 POKE &55ec,0,8,5,7,13,15,82,112,
  90,120,117,119,125,127,127,127
40 LET Text$="Large Characters"+CHR
  $ 22+CHR$ 0+CHR$ 150+"Written By
  ...."+CHR$ 22+CHR$ 72+CHR$ 128+"
  BUBEL"
50 PText 0,172
999 STOP
1000 DEF PROC PText X,Y
1005 LET Cpos=1
1010 IF LEN Text$=0 THEN GOTO 1080
1015 DO
1020 LET Char=CODE Text$(Cpos)
1025 IF Char>32 AND Char<128
1030 LET Char=Char-32
1035 PUT X,Y,Char$(Char)
1040 LET Char=Char+32
1045 END IF
1050 IF Char=22 THEN : LET X=CODE Tex
  t$(Cpos+1),Y=CODE Text$(Cpos+2),
  Cpos=Cpos+2: GOTO 1060
1055 IF Char=13 THEN LET X=-16,Y=Y-20
1057 IF Char=32 THEN LET X=X-4
1060 LET Cpos=Cpos+1,X=X+16
1065 EXIT IF Cpos>LEN Text$
1070 IF X>237 THEN LET X=0,Y=Y-20
1075 LOOP
1080 END PROC

```

Finally, let's stick with SAM. Remember last month that Dragon Curve from Ettrick Thomson of Aldeburgh, Suffolk? Well, Ettrick also enclosed "Prime Spiral Plus", which produces an interesting variation on the Prime Spiral, as introduced to FORMAT readers last February by Don Thomasson

in "Problem Solving". It builds up the Spiral in stages, which may explain why fragments arrive at intervals. The stages are associated with the prime numbers 2,3,5,7... I have a number of notes on the program for those particularly interested, but the main pieces of information are summarised as follows. First; for a full screen, you'll probably need to take a walk; if, for instance, m (input at the beginning) is 173, it will produce a spiral covering the full height of the screen in 2 hours 46 minutes. Secondly, at each stage the relevant prime is displayed. Try it...

```

5 REM prime spiral plus:Ettrick Th
  omson:
10 CLS # : INPUT "m (<=173):"m
20 PRINT m : POKE SVAR 50,1
30 LET n=m*(m+1): DIM n$(n)
40 LET p=1: DO
50 LET p=INSTR(p+1,n$," ")
60 EXIT IF NOT p
70 PRINT AT 1,0;p: IF p<=m
80 FOR i=p TO n STEP p
90 LET n$(i)="/" : NEXT i
100 END IF : LOOP :
200 PAUSE 50: CLS : PEN 5: LET p=1
210 DO : LET p=INSTR(p+1,n$," ")
220 EXIT IF p>=m
230 PRINT AT 0,0;p
240 LET q=p*p,d=-1
250 IF p=2: LET x=128,y=86: PLOT x,y
  : PLOT x+1,y: LET u=1,n=1
260 ELSE : LET x=128+p DIV 2,y=86-p
  DIV 2,u=p,n=q: END IF
270 FOR i=u TO m: LET d=-d
280 FOR j=u TO i: LET x=x+d
290 GOSUB 400: NEXT j: LET u=1
300 FOR j=1 TO i: LET y=y+d
310 GOSUB 400: NEXT j
320 NEXT i: LOOP
330 POKE SVAR 50,0: PEN 7: STOP
400 IF n=q THEN : PLOT PEN 15;x,y: P
  AUSE 2: PLOT x,y: LET q=q*p
410 LET n=n+1: RETURN

```

Many thanks, Ettrick.

And that's all for this month, folks. Thank you all, out there, for sending me such interesting snippets. Please keep the contributions coming to John Wase, Green Leys Cottage, Bishampton, Pershore, Worcs, WR10 2LX. Cheers.

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The HELP PAGE

Edited By:- Kevin Gould.

Sorry the Help Page was missing last month issue. This was caused by a disc corruption which happened somewhere between me and the FORMAT office. Still, I will try to get through as much as possible this month to catch up a bit.

In April's edition I mentioned expanding the Basic part of Tasword 2. What did I let myself in for by not giving edition numbers? So after searching the database that Jenny (my wife that is, not Jenny at FORMAT) entered all FORMATS on to, the following issues contain articles directly related to TW2 or programs associated in some way with it. In each case its Vol/Issue. 1/7, 1/11, 2/1, 3/2, 4/3, 4/4, 5/6 and 5/10.

Next, a very simple question which I have had from several readers. How can lines (using the line numbers) be deleted in blocks from a Spectrum Basic program? Well, block delete routines have been published several times before in Short Spot but the following is one answer which came from a very old Spectrum magazine which I was recently given snippets of. Type in these lines and save them.

```
9900 REM Basic program block delete.
9901 REM Type GOTO 9910 to use.
9910 DATA 33,0,0,205,110,25,229,33,0,0
,35,205,110,25,209,205,229,25,201
9920 RESTORE 9900: FOR N=0 TO 18: READ
A: POKE 23300+N,A: NEXT N
9930 INPUT "Start at line ";A
9940 POKE 23301,A-256*INT (A/256): POK
E 23302,INT (A/256)
9950 INPUT "Finish at line ";B
9960 POKE 23308,B-256*INT (B/256): POK
E 23309,INT (B/256)
9970 RANDOMIZE USR 23300
```

To use, MERGE this routine with your Basic program and then type GOTO 9900.

This to me is one of the most fantastic utilities out, and so is BASIC-TAS (this is how this BlockDel routine got here) another from FORMAT, anyone know the maximum file size in Basic (.e before conversion) that Basic-Tasword can handle?

The one thing I would mention about Basic-Tasword is that you need a System file that you have answered "NO" to the printer bit, otherwise it will not work. I would suggest that you boot with the non-printer one, do the converting and load the printer version if you want it.

Now over to Ray for your SAM answers.

I will start this month with a follow-up on three items in previous Help Pages. First the "phantom I" problem with The Secretary word-processor. Stuart Hale of Northolt writes to say that he cured the problem on his Citizen 120D by changing the IBM Character selection code from the default setting to 27,126,53,1,13,27,54. We also changed the following default settings:-

```
ITALICS ON = 27,33,64 OFF = 27,37
NORMAL SIZE = 27,87,48,27,126,49,
48,27,84
DOUBLE HEIGHT = 27,126,49,49.
```

He does, however, have another problem in that he is unable to change the line spacing using the PRINT / S option. Has anyone else found this problem, and discovered a cure?

In commenting on Eric Day's problem of losing all his files when trying to make a back-up disc, I managed to edit out the vital piece of advice to always set the Write Protect tab on the source disc before making a back-up, particularly if you only have

one drive. However, don't forget to reset the tab once you have finished. Also make sure the discs are clearly marked.

The final item to revisit is Malcolm Jones's difficulty in trying to FORMAT more than one RAM disc. Malcolm wrote to me again giving more information and, as I suspected, his problem was to do with the size of RAM disc he was trying to declare. His question does raise a point that some readers may not be aware of, although it is covered in the MasterDOS User Manual. The DOS allocates memory to RAM discs in whole pages, (16K portions). A disc is declared in Tracks, which are 5K long making 5 X 1024 = 5120 bytes per track. If for instance you decided to have three RAM discs each 65 tracks long this would appear to need 65 X 5120 = 332800 bytes per disc, making a total of 998400 bytes for the three discs, which should fit comfortably into the 1024000 bytes available in the 1mb extension.

However, because the memory is allocated in 16k blocks, each 65 track disc will require 21 pages of memory which is 344064 bytes making a total of 1032192 bytes for the three discs. Because this is too large for the 1mb extension, only two discs are located there, the third has to be located in the main memory. The top four pages of main memory are allocated to the screen, DOS and MasterBasic, and the RAM disc is placed below these, leaving only 7 out of the 32 pages available for the program. If a reasonable sized program has been loaded before the RAM discs are declared, or you have opened additional screens, it is more than likely you will get an "Out of Memory" message, despite the fact that you have 352K of unused memory in the extension. The moral is, that to make the most effective use of memory, you have to think carefully about how many tracks are allocated to RAM discs, even without the 1mb extension.

The first SAM query this month comes from Lee Hillis of Wirral who wishes to know in which issue of FORMAT Rev

Young's explanation of the SAM interrupts can be found. This appeared in Vol.4/10 on page 33. His next question concerns the E-Tracker music program which works with the demonstration files but as yet he has been unable to work out how to play his own music under the interrupt driver. The Manual states that "You can play your own music with a modified version of this program.", but he has no idea how to modify it. The answer is really quite simple and should perhaps have been made clearer in the Manual. Having compiled your music with the compiler on the disc, following the instructions in the Manual, load the INT-MUSIC program and BREAK into it. Looking through the listing you will come across a REM line which says in effect that, to play your own music you should delete the filename "MUSIC" (which is the demonstration file), and replace it with the filename of your own music. The name in question can be found below the REM line. Having done that you should load your music disc into the drive and run the program and all should be well. Since drafting this reply I have received a note from Lee saying that he has since discovered that his problem lay in the compilation of the code rather than in the INT-MUSIC program. The Manual (page 19) states; "You will be prompted for an address we suggest you ALWAYS use address 16384". In fact the address should be 32768 which was listed in the Manual errata sheet which he had unfortunately lost.

Lee also pointed out that the BASIC loop program mentioned in the Manual is not included with the programs on the disc. He offers the following short program to perform this function.

```
10 LOAD "filename" CODE 32768
20 DO
30 CALL 32774
40 PAUSE .5
50 LOOP
```

Now for a general point raised along with a number of detailed questions which I have answered directly to the

questioner. When a program is divided into separate parts and saved to disc, why is the sum of the size of the parts invariably greater than the size of the original program?

There are two reasons why this can be so. Firstly the Directory records the length of a program in whole sectors, therefore if the original program was 100 sectors long and it was divided into 3 equal parts, then each part would be 33 1/3 sectors long but would be shown in the Directory as 34 sectors, making a total of 102 for all three parts. The second and more important reason for the difference can be caused by not executing a CLEAR before saving the original program or before saving the parts.

If a CLEAR is not executed then the variables area used by the program is saved along with the program. If that program is then divided into sections by just deleting the unwanted lines and not executing a CLEAR, then the original variables area is saved with EACH section. Taking the example above, a program 100 sectors long is likely to have a large number of variables occupying say 4 sectors, therefore each part saved would then be shown in the Directory listing as being 38 sectors long making a total of 114 sectors, compared with 100 for the original program.

Peter Morgalla of Chippenham writes to ask whether the BREAK key can be inhibited when running Spectrum programs with an emulator. Also, how can he change the key functions when running under emulation? The answer to your first query is yes. One of the advantages of running Spectrum programs on SAM is that you have the opportunity to play around with the Spectrum ROM to do various things that can't be done on a Spectrum. As long as your emulator has not already altered the KEY-BREAK sub-routine you can inhibit the BREAK key as follows:-

```
a. Load the ROM version that the emulator uses at address 100000.
b. POKE 108024,55 and POKL 108025,201.
```

c. Save the amended ROM (you may wish to use a different name).

d. Break into the BASIC loader for the emulator and find the ROM loading routine. Amend the filename and check that the routine includes a loading address, as the amended ROM will have a start address of 100000 in the Directory. If it doesn't have an address, look at the address of the original ROM in the Directory and insert that in the loading routine.

e. Save the amended loader.

On the question of changing the key functions, it depends on what you wish to do. It is quite simple to switch the function of one key so that it performs that of another, but if you wish to carry out a more complex function using a single keystroke, such as the facility offered by the DEF KEYCODE command on SAM, you will have to break into the Spectrum keyboard routine at some point and divert the ROM to your own routine. Alternatively, if you don't mind using two key strokes such as ".A" to call a special facility, then an interrupt routine can be used to divert the ROM to your own sub-routine.

To simply change the function of a key all that is needed is to change the value against that key in the ROM Key Tables. On the Spectrum the tables are from address 517 to 653 and you can disassemble them using the short routine below. The codes with blanks or "?" against them are the unprintable codes and can be interpreted from the code table in your handbook. The code block from address 517 to 555 are for both lower case and CAPS shifted letter and digit keys in "L" mode. The code block 556 to 581 are Extended mode unshifted letter keys. The block 582 to 607 are Extended mode letter keys using either shift. The block 608 to 617 are control codes and digit keys with CAPS shift. The block 618 to 643 are letter keys with symbol shift. The block 644 to 653 are Extended mode digit keys with symbol shift.

```
10 REM Program to dis-assemble the Key Code Tables
```



```

20 FOR N=517 TO 653: LET C=PEEK N
30 LPRINT N: "="; C; TAB 7; "-";
TAB 10; CHR$ C
40 NEXT N

```

also, by changing line 20 to "8020 TO 8031" the Key Break subroutine is printed.

Peter also posed one general question on printers, the answer to which I honestly don't know. Why is it necessary to add a semicolon at the end of some control code strings to ensure that garbage is not produced, whilst after some others it is not. I have puzzled over this one for a long time for, although examples given in the printer handbook show both forms, no explanation is given and there are insufficient examples to show a logical pattern. I now put semicolons at the end of all control code strings and it seems to work. Can anyone please explain this?

And now a little bit from Steve Marr as a reply to M.V.Holden question on Uni-DOS advanced commands in the May issue.

Hidden files are created by adding 128 to the disc filetype (this also hides them with G+DOS). Uni-DOS protected files also have 64 added to the filetype. There is a CREATE file which allows you to change the hidden/protected status automatically. For example, with "hide code" loaded: EXP +h:d1"file1" would hide a file.

I'm surprised that Mr Holden has problems using random streams and directories because they are well covered in the manual although perhaps his problem is with the basic concepts of what these operations do. He probably needs to look at some examples and that's up to FORMAT readers....

Thanks Steve for the help on UNI-DOS and thanks for mentioning that the language 'C' is also available, yes, I did forget it.

Now the \$64,000 question:- Is it possible to connect a hard drive to the PLUS D (with either G+DOS or

UNI-DOS) keeping the 3.5" floppy.

Answer:- No. The DISCIPLE/PLUS D will work with any Shugart 400 standard drive, in fact they were designed to be 'plug compatible' with drives for the BBC'B' computer. Hard drives are totally different and require different disc controller chips from the 1772 used by MGT. Sorry, but until some nice hardware man builds an interface, and until someone writes a DOS that will cope with it, hard drives remain a dream.

Well, that's about it.. Keep those questions/answers coming. The addresses as usual are:-

Spectrum:-

Kevin Gould, 2, Barleyfield Close,
Heighington, Lincolnshire, LN4 1TX

SAM:-

Ray Bray, "Elmsleigh", 4, Tidworth Rd,
Porton, Salisbury, Wiltshire, SP4 0NG.

Spectrum+3 and CP/M:-

Mike Atkins, 70, Rudgwick Drive,
Bury, Lancashire, BL8 1YE.

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INSIDE SPECFILE+

Or "Some Advanced Programming On The Spectrum"

By:- Ken Elston.

As many of you will know I am a great fan of Specfile+, the Spectrum filing program from SD Software. Not only did I have the privilege of reviewing this excellent program when it was first released but Bob was good enough to print a follow-up article of mine a little later.

Since then, alas, I have been far too busy on other matters to pen another article (which I did hint I was going to do at the time). Now, with a little bullying from Bob, and a plea for enlightenment from format reader Jack Gibson, I've been persuaded to do something.

First a little setting of the scene. SF+ is a very powerful filing program (often mistakenly called a database - database programs are really something quite different and no home micro can really claim one at the moment). It has complex machine code that does all the work that needs to be fast - but the author wisely chose to put most of the real control into Basic. This allows users to modify or extend the scope of the program - tailoring record handling and printouts to their own personal requirements.

What prompted this small article was a letter from Jack Gibson who is puzzled by some of the lines that exist in the Basic part of SF+. Now I have to say right from the beginning that the lines he is querying have nothing to do with the expandability of the program - as far as I can see that is - but they are interesting to look at.

Consider this then a lesson in advanced Spectrum Basic - we will just use SF+ as the example. You don't need to have a copy of SF+ to follow my points and alas I'm not on commission even if you do go out and buy a copy

(which I hope you will because its a great program).

The first line that Jack puzzled over reads like this:-

```

50 IF Y$="D" OR Y$=" STEP " THEN LET
X$=X$: GOTO 250

```

the statement he doesn't understand is the LET X\$=X\$, "what does it do" asks Jack. Well it makes X\$ the same as X\$, in other words it does nothing from the Basic point of view. However, the programmer uses the statement several times in the program to save a lot of work in machine code. You see X\$ hold the instruction line, more often than not this is the word (or collection of words) that the user wants to search the file for. The machine code needs to know where to find X\$ and there are three ways this could be done.

1) It would be possible to find it in memory using ROM routines but calling ROM routines is very bad practice in machine code circles - you never know when somebody will change the ROM.

2) The programmer could search memory until he finds the string variable. Each variable is named and string variables have their length so a search (in much the same way as the ROM routine does it) would find X\$.

3) The easy (and lazy) way. Use the ROM routine, but do it from Basic so there can never be a problem. What happens when the program gets to the instruction LET X\$=X\$ is that the ROM finds X\$ in memory, makes a new X\$, copies the old X\$ to it and then deletes the old X\$. The side effect is that the system variable DEST (at 23629) is left pointing at X\$, just what the programmer wanted. It also takes up less memory than any other

solution - something the programmer was very keen to do.

Within the machine code the programmer can always find 0\$ (the variable that is used to store the data file) because it was the first variable DIMed as the program was run and is therefore always in the same place relative to the system variable VARS (at 23627). Try it yourself with this little test

```
10 DIM A$(15)
20 INPUT "Type in your name : ";I$
30 LET A$(1 TO 15)=I$
40 LET P= PEEK 23627+256* PEEK 23628
50 LET P=P+6
60 PRINT "YOU NAME IS : ";
70 FOR I=0 TO 14
80 PRINT CHR$(PEEK (P+I));
90 NEXT I
100 PRINT "'Very nice to meet you."
```

Line 40 points to the start of the variable area which sits above the Basic program in memory. This area moves up or down if you add or delete a Basic line and it will also move if you open channels to disc or microdrive files. Line 50 adds 6 to it to skip over the variable name, type and length.

So, there you have it, two ways in which Specfile+ finds the data it wants. But the X\$=X\$ solution to finding the search string presented another problem to the programmer. How to get into machine code without disturbing things.

You will all be familiar with the most common way of calling Spectrum machine code. RANDOMIZE USR nnnn calls the machine code routine at nnnn. But it has a drawback - it changes the seed for the random number generator stored in the system variable SEED (23670). In SF+ this location is used by the machine code to return certain pointers for use elsewhere in the program. PRINT USR nnnn could be used, but this alters the pointers used by the ROM's print routines and also prints an unwanted number to the screen. LET A=USR can't be used because it would alter the system

variable DEST which, as we have seen above, is a vital pointer to X\$ when the machine code is entered.

Unlike the SAM which has a CALL instruction there seems to be no way to get into machine code on the Spectrum without upsetting something. Well, as luck would have it there is a way - and the programmer found it.

Several lines, including line 290, end with the statement like:-

```
IF USR 64154 THEN
```

That's right, there is nothing after the THEN except the end of line. The Spectrum calls the machine code, evaluates the result as TRUE or FALSE (something covered many times before in FORMAT) and then gets to the THEN. With nothing after the THEN the program just continues with the next line. The programmers objective has been achieved, the machine code has been called with no change to any of the system variables used and with no corruption of the screen. Just what the Doctor ordered, the only limit is that it must be either the only or the last instruction on a line - a small price to pay.

All in all I found these programming tricks quite useful - especially the X\$=X\$ one which I now use quite frequently now. I hope my comments can be understood by most of you and I promise that, one day, I will get round to writing another article on adding features to Specfile+.



"I really think you should try marriage guidance first Mr Bundock."

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SAM NEWSLETTER - ISSUE 2 - SUMMER 1993

Welcome to the second SAM NEWSLETTER, we are sorry it has taken so long to produce but things have been pretty hectic for us so far this year.

We would like to start by expressing our thanks to all out there in SAM-LAND who wrote such encouraging letters to us following our first newsletter, sorry we can't reply to everyone personally - but thanks anyway. We would also like to express our thanks to Format Publications who, because we could not find anyone else mad enough to do it, took on the job of compiling our mailing list for us and handling our first big mail-shot. Knowing how bad the SAMCO database was (that is the one we inherited from Sam Computers Ltd.) we really appreciate how difficult a job it was.

We are currently planning a complete revamp of our sales and distribution system in preparation for a big sales push starting in September. As part of this we are looking to contact the old Samco Agents - we have heard from a few, but Samco's computer records do not indicate who else was involved. If you were a Samco Agent, either in the UK or overseas, then please drop us a line at the above address - include a telephone number and we will get in touch to talk things over.

Software now seems to be flowing very well for SAM. Revelation Software have recently launched a really powerful spreadsheet program called CAMPION priced at £29.95. It received a good review in the June issue of FORMAT which compared it very favourably to programs running on PC machines that cost many times the price. Campion is also available in a Spectrum version at the same price - a little slower and with less memory to play with but still fantastic value. Spectrum owners can upgrade cheaply to the SAM version when they want to. Revelation's latest game 'WOP GAMMA' has received rave reviews including an 88% from Your Sinclair. At £9.99 it is good value for money as it has 99 levels of colourful fast action graphics. Revelation also have several new SAM games due for launch this autumn and they have also said that they are planning a range of Spectrum games as well.

Fred Publishing continue their monthly disc based magazine which now incorporates the SAM version of OUTLET which was formally published by Chevron Software. The full range of past issues of FRED (now on issue 35) and

all the back issues of OUTLET are available now direct from Fred Publishing. Issues of both FRED and OUTLET disczines contain a wealth of programs and demos unrivalled in the SAM world. Fred Publishing have also launched several new games during the first half of this year and we hear that others are coming soon - one of them involving a licence deal with one of the UK's major software houses.

Betasoft, the company run by Dr. Andy Wright who wrote the ROM for the SAM Coupé, continues to enjoy great success with the games writing system GAMES MASTER. Reviews have appeared in several places including issue 6/7 of FORMAT. The system is capable of producing commercial quality 'stand-alone' games and, because most of the design of a game is controlled by a menu driven editor, it is claimed that no programming expertise is required. At £24.99 (including UK postage) the program is a must for anyone fed-up with playing other peoples games and invaluable for anyone who wants to write games without resorting to machine code.

When we took over from SAMCO we felt that it was our job to concentrate on producing the best 'value for money' computer we could - and the extras to go with it. Here at West Coast we have had Blue Alpha slaving away with a hot soldering iron for the last few months developing a new modem for SAM. Called 'The Communicator' it plugs into SAM via the Card Cage/Sam Bus, no need for the RS232(COMMS) interface. Final testing is underway but the writing of suitable software now seems to point to a launch date in October - more news as soon as we have it, however we, and Blue Alpha, would be interested in hearing from anyone who may have suitable communications software, or the experience to write it, that could be adapted to work with 'The Communicator'.

Blue Alpha has also been working hard developing a new product for all you joy-stick users out there. The Blue Alpha 'REMOTE' lets you use your own favourite joy-stick from anywhere in your room - even in some cases round corners. Other remote joy-sticks require you to have direct line of sight because they use Infra-Red light to pass the signal. Most also require you to use their own special joy-stick. Blue Alpha really thought about what the user wants and have come up with a two part interface, one part to attach to your very own joy-stick while the other part plugs into your computer. It then uses Ultra Sonic sound to provide the link so it doesn't require you to sit still with the transmitter carefully pointed at the receiver - you can waggle that joy-stick as much as you like and those nasty aliens will still get shot. The Blue Alpha 'REMOTE' normally costs £34.99 plus £2 postage and packing. But, just for Newsletter readers we have arranged a special price of just £29.99 all in if you order before the end of August - just mention us when you place your order.

Returning to software for a moment SAM now has its own DTP program. Produced by Steve's Software SC_DTP costs £25. It contains many of the features you would expect from a DTP program and others are being added as the program develops. Steve's Software will be providing FREE upgrades as enhancements become available so there is no need to wait - you can buy now with the confidence that you won't be left behind.

So hardware and software development are still going on - but what else is happening in the SAM world. Well I can say that a rewrite of the SAM User Guide is now under way, it will be some months before it is ready and if any of you have any contributions you want to make to the new manual then get in contact with Bob Brenchley at Format Publications as he is handling the project for us. We are particularly looking for lots of small routines that demonstrate selected basic commands so they can be used as examples in the manual. Bob has said that he will publish some of the routines in Format even if they don't get used in the new manual. This is going to be quite a long project but as soon as the new manual is ready we will make it available to existing SAM users.

A lot of interest has also been shown in our new *Trade Up* scheme. This is designed to enable Spectrum users to upgrade to a SAM by trading in their old Spectrum (as long as it is working) and getting a massive £50 reduction on SAM. All they need is a working Spectrum (48K, 128K, +2, +2A or +3) complete with power supply and manual. If you have any Spectrum owning friends who are getting jealous of your SAM then point them in the direction of the *Trade Up* scheme. Get them to drop us a line and we will send them details.

Returning now to software, we believe that SAM can hold its own against most other computers - some of the software produced so far is nothing short of stunning - and at a price that people can afford. However, there is always room for more. So, if you have written any games, utilities, in fact any kind of software, then we would love to see it. We do not intend to get involved in publishing ourselves - but we are prepared to offer FREE and unbiased advice on how best to get your piece of software to a wider audience, and hopefully you will then be able to make your computer hobby pay for itself.

Well that's all, there is room for this time. We will try not to leave it quite so long before putting ink on paper to you again.

Westcoast

Addresses.-

Betasoft, 24 Wyche Avenue Kings Heath Birmingham, B14 6LQ
Blue Alpha Electronics, Abernart Centre For Enterprise Rhyd-y-fro, Pontardawe SA8 4TY
Format Publications, 34 Bourton Road, Gloucester GL4 0LE
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UNDERSTANDING DIGITAL ELECTRONICS

By:- Adrian Parker.

If you have survived the initial onslaught of theory we have covered so far, we are now going to further our understanding by first introducing a few new logic gates. We will follow this with a simple introduction to the workings of the computer.

Do you remember the logic gates we have looked at? Do you still know what an AND gate, OR gate and a NOT gate will do with their outputs for a specific set of inputs? Try this problem, what is the logic function described by the truth table below (a three input gate is shown, just to confuse you).

A	B	C	Output
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

Did you decide that the truth table represented a 3 input OR gate? That is what it is. If you look at any horizontal line of the truth table, the output is high (ie a one) if A is high OR B is high OR C is high - hence this is a description of an OR gate

We are now going to introduce a variant of the gates which are commonly available. The four gates that we considered so far are AND, OR, XOR and NOT. Well, there are also gates known as NAND, NOR and XNOR.

To take one as an example, the NAND gate is equivalent to an AND gate with a NOT gate connected to its output. This has the effect of 'inverting' all

of the items in the output column of the truth table (ie all ones become zeros and vice versa). As the NOT gate has this inverting function, it is sometimes called an inverter. Similarly:-

NOR = OR followed by a NOT
XNOR = XOR followed by a NOT

The symbols for these gates are shown in below as Figure 1. If you compare them with the gates from last month, you will see that they are identical - except that each has a circle on its output, just like the NOT gate which we also printed last month.



2 Input NAND Gate



2 Input NOR Gate



2 Input XNOR Gate

fig. 1.

The truth tables for these new gates

are shown below:-

2 Input NAND

A	B	Out
0	0	1
0	1	1
1	0	1
1	1	0

2 Input NOR

A	B	Out
0	0	1
0	1	0
1	0	0
1	1	0

2 Input XNOR

A	B	Out
0	0	1
0	1	0
1	0	0
1	1	1

If you compare these truth-tables with those from last month, you will see that the relation between an AND and NAND, is that for any horizontal row the output is inverted in the NAND to the AND gate. The same relation holds between the OR and NOR, and the XOR and XNOR gates.

Yet more theory! What has this to do with hardware? We will be getting to that. Make sure that you understand the function of these gates and remember them, they will be very important in future articles.

Let's take a simplified look at the computer sitting in front of you - the SAM Coupé. There are several building blocks at the heart of any computer, and your Coupé is no exception. We are going to demonstrate the operation of each block by an analogy which applies equally as well to the Spectrum. Do you know the arcade and computer game 'Paperboy', where you ride your

bicycle delivering different papers to the homes that need them? Our computer can be thought of in these terms. So consider a typical day, and we will show you the similarities. The paperboy must set off from the shop, but he doesn't sell the newspapers, he only delivers them. The 'housekeeping' activities (e.g. taking orders, assembling his bag of papers) is all done for him. We also need something in our computer to take care of the 'house-keeping' - it needs to know how to put information on the screen, which characters correspond to what keys - all of the items that you take for granted. These tasks are taken care of by the Read Only Memory, usually abbreviated to as ROM. The ROM will store these house-keeping activities permanently, so that our newsagent's shop (in our case the computer) can operate efficiently.

So our paperboy sets off on his bike, with his different papers, to the houses who have ordered them. Now this is a very clever paperboy. He has 'trained' his customers, so that when he gets to the end of the street, he shouts the number of the house that he needs to deliver to, and the person at that address will open their door, so that he can throw the paper in to land on their mat. Similarly with our computer, we have a 'paperboy' (as one of its many jobs) in the form a micro-processor, also sometimes known as the 'Central Processing Unit' (or CPU). The name of our paperboy is 'Z80B'. That may seem like a strange name, but it isn't amongst CPUs. (A close relative of our paperboy, called Z80A, used to live in the Spectrum computers - but Z80B is faster at his job, that is the only difference.) So the Z80B has to 'shout out' the address that it wishes to deliver to. It isn't people that live at the addresses in the computer, but 'devices'. A device can be anything, a printer interface, sound chip, speech synthesiser, etc. The CPU assumes that everybody is listening, and that no two different devices live at the same address, because if two devices opened their door when the CPU shouts one address, the two devices would fight

over the newspapers and the paper would be destroyed. However, a 'family' lives at each address in the computer. The family always numbers eight, and each family member belongs to a race called the 'Binary Bit'. (We met these 'bits' last month when we introduced binary as a counting method.) Each 'family' of eight 'bits', in the language of the computer, is known as a 'byte'.

So, to recap on the last paragraph, without the analogies. We have a ROM in our computer, which 'knows' how to organise the housekeeping activities. We have a CPU, or micro-processor, which can shout out an address, and deliver information to the 8 bit byte that exists at that address, provided that the byte knows its address and opens its door to allow the information from the CPU to pass in. That information will then be locked away at that address, until more information is delivered there (a byte can only store one piece of information per bit at a time). As we stated last month, computer 'bits' can only deal in ones and zeros, in a similar way to our logic. So our information is now limited to either a one or zero for each bit in each byte at each address in our computer world.

Let's return to our newsagent analogy. Our newsagent (ROM) is an enterprising sort of chap, and not only does he deliver newspapers, but he also runs a courier service, whereby he can tell his paperboy (Z80B) to collect information from a family (byte) at a particular address. So now, not only does the ROM have to tell the Z80B the address, the ROM will either tell the Z80B to deliver information, and give it the relevant information to deliver, or it will tell the CPU to collect information from that address and to bring it back. To complicate matters further, the town in which the CPU is delivering to is split into two halves. In each half of the town, the addresses range from 0 to 65535. Now as we mentioned previously, we cannot have two devices opening their door at the same time, ie no two devices can

have the same address. The ROM prevents this from happening by telling the CPU which side of town, and which address there that it has to visit. So now the Z80B will shout out the address and the side of town that it wants. One side of town is called 'Memory', and has a family of eight people living at each and every address. The other side of town is near the sea and is called 'Port'. The Port area of town is sparsely populated and so does not have any device living at many of its addresses, but, just as in the Memory area of town, a device is always found in a family of eight bits as a byte.

What do these analogies mean in our computer world? Well, there is another building block of our computer called 'Memory'. This block contains many locations each of which has a unique address. The memory is constantly 'listening' for the Z80B to 'shout' an address, and also, for whether the CPU 'shouts' that it is accessing Memory, or a Port. If the CPU shouts "Port", the memory will ignore the address, and if the CPU shouts "Memory", along with an address which that memory block understands, that location will 'open its door' to the CPU. The CPU also shouts whether it is delivering or collecting information, so that the device responding to the address 'knows' whether to send out information or receive it. Now as we are really talking about information, and not newspapers, sending info can be thought of as WRITEing data (the information is normally called data) INTO a location. Conversely, collecting information can be thought of as READING data FROM a location.

What do we mean by the CPU 'shouting' data and/or an address? The CPU is connected to the ROM, the memory and anything else that needs information, via 'wires' embedded on the computer board (the thing that sits inside your computer that all the components sit on) called tracks. However, each of these wires can only represent a one or a zero. You may remember from last month that we can use ones and zeros to represent any

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number in binary. The CPU has a group of sixteen tracks which it uses to represent binary numbers in the range 0 to 65535 (65536 combinations = 2 to the power of 16). As we said earlier, in our computer world we need to be able to access addresses in the range 0 to 65535. So this group of sixteen tracks will do it for us. This group of wires is called the Address Bus.

In a similar manner, there is a separate group of eight tracks that are connected to every device and to the CPU which are used for carrying the data. As we have eight tracks we can carry binary numbers in the range 0 to 255 (256 combinations = 2 to the power of 8). In addition to this, we have various control lines from the CPU such as the 'Read' and 'Write' lines. These are also connected to each device and instruct each device whether the CPU is performing a read or write operation. Although the control lines are connected to all devices, only one should respond to a given address.

Finally, the CPU is also linked to each device by two more control lines, called 'Input/Output Request' (IORQL) and the 'Memory Request' (MEMRQL). The memory request signal becomes active if the CPU is sending an address that should be recognised by the memory, (remember the paperboy shouting 'Memory' or 'Port?') and the input/output request becomes active if the CPU is trying to communicate with a port. (A port is sometimes known as an input/output or I/O device.)

We are actually very close to our computer at this point. We have a ROM which contains a list of instructions (a program) telling the CPU what to do. At the moment we are concerned only with instructions such as read (get information) or write (send information) to and from memory (but exactly the same applies to a port). The CPU carries out these instructions by:-

Setting up the address bus with the particular address that it wishes to talk to.

Making either the READ or the WRITE control line active.

Setting up the data on the data bus.

Making either the memory request (MEMRQL) or the I/O request (IORQL) active.

N.B. All of these operations occur simultaneously.

Now, if you program in Basic (or machine code for that matter) you may be wondering what commands you give that make the CPU behave in this way. The two simplest commands to explain this are POKE and PEEK. You may have used these commands in the past, but let's examine their operation in detail.

Consider the Basic statement POKE 32768,255. This statement sends the data value 255 to memory address 32768. If the ROM were to give this command directly to the CPU, the CPU would perform this operation by:-

Sending 10000000000000 in binary on the address bus (this is 32768 in binary)

Making the WRITE control line active (we have instructed the CPU to PUT data somewhere, so we are effectively asking it to write data)

Sending 11111111 in binary on the data bus (this is 255 in binary)

Making the MEMRQL control line active (the POKE instruction can only refer to memory locations, it cannot access ports. Later we will see instructions that can access ports.)

Do you see how this works in terms of our earlier analogies? If not, re-read the "paperboy" analogy until you can understand this. Once you can understand the operation of the POKE statement, each other command is very similar. Consider the Basic statement LET a = PEEK 32768. This statement takes whatever value is in memory location 32768 and stores it in the variable 'a'. To execute this command,

the CPU first reads the data from location 32768 into itself, and then puts the information into variable 'a'. We are not interested in the second step here. The first step of getting the data from the memory is performed by the CPU:-

Sending 1000000000000000 in binary on the address bus (this is 32768 in binary)

Making the READ control line active (we have instructed the CPU to GET some data, so we are effectively asking it to read data from somewhere).

Not sending anything on the data bus, but waiting for the device being accessed to send the data to the CPU, and opening a door into the CPU so that the data from the device can be captured into the CPU

Making the MEMRQ control line active (the PEEK instruction, just like the POKE, cannot access ports.)

There are two other Basic commands (IN and OUT) that you may not have used, which do allow us to access ports. These commands are shown with their corresponding POKE and PEEK equivalents below:-

```
OUT (32768),255 : POKE 32768,255
LET a=IN(32768) : LET a=PEEK(32768)
```

These instruct the CPU to perform identical operations to those above, except that now the memory request line will remain inactive, but the I/O request line now goes active when the CPU performs these operations. (The paperboy shouts 'Port' instead of 'Memory'.) The OUT instruction performs a processor WRITE function (like POKE) and the IN instruction performs a processor READ function (like PEEK).

How does this help us in designing interfaces for our computer? Well, what we have described here is the only way in which the CPU can communicate with devices, internal or external. So, we have to get our

hardware to respond to a unique (ie otherwise unused) address. Now as we said earlier, the memory addresses are all fully used, but the port addresses are only partially used, and so we should give our hardware a port address. You might like to consider what happens if we do give our hardware a memory address that also corresponds to a memory location.

However, we do not have an unlimited choice of port addresses, even if you do not have any external hardware connected. There are ports which have been set up internally to the computer. The ASIC, which helps the general control of the computer operations, monitors the address and control lines in an identical manner to the way that we have to get our hardware to. The port addresses that the ASIC detects are shown in the technical manual. Now, according to the technical manual, Port 254 is the BORDER PORT. So if we issue an instruction like OUT 254,1 this will cause the CPU to send the data (1) to port (254). The ASIC, whilst monitoring (listening to) the address bus and control lines, will 'realize' that port 254 is contained within itself, and so 'open a door' to the data bus to 'capture' the data bus contents. (Remember, OUT means WRITE from the CPU to the address.) Try it, the above command should turn the border blue. All well and good, the principle seems to work. However, here is a little puzzle for you. Try the following commands from Basic:-

```
OUT 254,1
OUT 510,1
OUT 22014,1
OUT 43774,1
OUT 65534,1
```

All of these commands should set the border to blue! Try working out what binary information is present on the address and data buses and control lines in each of these cases and see if you can come up with an explanation of why each of these expressions has the same effect. We are not going to give you the answer here, but we will be explaining it next month.

MACHINE CODE

WITHOUT THE TEARS

Part 19.

By:- Carol Brooksbank.

Today I want to look at the FPC's memories, and take a closer look at its use in string manipulation.

Both Sam and Spectrum FPC's have 6 memory stores, each capable of holding a number in 5-byte form - small integer or full floating point. The literals are:-

1) STORE TOP NUMBER ON FPC STACK IN:

Memory	Spec	Sam
0	192	208
1	193	209
2	194	210
3	195	211
4	196	212
5	197	213

2) STACK ON FPC STACK VALUE HELD IN:

Memory	Spec	Sam
0	224	216
1	225	217
2	226	218
3	227	219
4	228	220
5	229	221

3) STORE NUMBER FROM FPC STACK IN: and then delete from stack. (SAM ONLY)

Memory	Literal
0	200
1	201
2	202
3	203
4	204
5	205

Storing the number using the literals in list 1 will only copy the number to the store. It will still be on the FPC stack, and you must use DELETE to remove it if you need to. Sam has another block of literals, (list 3) which will store the number and automatically delete it from the stack.

I shall not be using these Sam only literals in this series, so that the listings for Sam and Spectrum can be more or less the same, but Sam users can always substitute a literal from list 3 and omit DEFB DELETE when we do a store-and-delete operation.

These stores are temporary stores for numbers you need again in the present series of calculations. Don't think of them as handy places to store odd values on a long-term basis. The computer uses the stores too, and you may find your number has been overwritten. Spectrum itself only ever uses memories 0-2, so you are quite safe in using 3-5 all the time. Sam uses all of the memories. They are most likely to be corrupted by operations like SIN, COS and STR\$, so if you are using the FPC for any of those on Sam you might be wise to set up your own 5-byte storage area among your program variables, exit the FPC, fetch the number using CALL GET5BYT (CALL 292) and store it there until you need it again. For less complex calculations you are safe in using the FPC memories.

The routine I am going to give you now is another way of stacking numbers held as strings. It doesn't use VAL, so Sam users can put it anywhere in memory, but it does make use of a calculator memory - we shall be using MEM3. Compare it with last month's routine for doing the same calculation.

```

ORG 7777?
STKZERO EQU 160;(Sam 225)
RESTACK EQU 61;(Sam 49)
ENDCAL EQU 56;(Sam 51)
EXCH EQU 1;(Sam 6)
STKTEN EQU 164;(Sam 236)
MULTIP EQU 4;(Sam 0)
ADD EQU 15;(Sam 1)
STKONE EQU 161;(Sam 233)
STOMEM3 EQU 195;(Sam 211)
GETMEM3 EQU 227;(Sam 219)
DELETE EQU 2;(Sam 7)
SETSTR EQU 5633;(Sam 274)
DIVID EQU 5
STKBYT EQU 11560;(Sam omit)
PRINTFP EQU 11747;(Sam omit)

```

Be sure to enter the correct value for your machine.

```

START LD HL,NUM1
CALL DEC.FPC
LD A,3;(Sam LD B)
CALL STKBYT
RST 40
DEFB RESTACK
DEFB MULTIP
DEFB ENDCAL
LD HL,NUM2
CALL DEC.FPC
RST 40
DEFB ADD
DEFB ENDCAL
LD A,2;(Sam omit)
CALL SETSTR;(Sam omit)
CALL PRINTFP
RET

```

The main routine is much shorter than last month's because we call the new subroutine DEC.FPC to stack numbers stored as strings.

```

NUM1 DEFM "23.25"
DEFB 13
NUM2 DEFM "72314"
DEFB 13

```

The numbers are still stored as strings, but each now has CHR\$ 13 as an end marker - we no longer need to calculate their length.

```

DEC FPC PUSH HL
RST 40
DEFB STKZERO
DEFB RESTACK
DEFB ENDCAL

```

The subroutine is called with HL holding the address of the string of the number we want to stack. The routine continually adds the current digit to the "last value", so we begin by stacking zero as our start-off last value.

```

POP HL
LD A,(HL)
CP 46
JR Z,DECIM

```

We fetch the first digit, and check whether it is a decimal point (ASCII code 46.) If so, the number is 0.something-or-other so we have no integer part to deal with and jump forward.

```

INTLOOP PUSH HL
SUB 48
LD B,A;(Spectrum omit)
CALL STKBYT

```

The digit is the first one of the integer part, so we deduct 48 from its ASCII code, to get the digit itself, and stack it.

```

RST 40
DEFB RESTACK
DEFB EXCH
DEFB STKTEN
DEFB RESTACK
DEFB MULTIP
DEFB ADD
DEFB ENDCAL

```

A new digit means the previous ones - the last value - have to be multiplied by 10 before it is added. (If we had 20 as the last value, and the new digit was 3, it would mean the number is 203 - 20*10+3=203). We use EXCH to swap the top numbers, leaving the last value on top and the new digit below. 10 is stacked, multiplied by the last value, and ADD adds the new digit, leaving the new last value on top.

```

POP HL
INC HL
LD A,(HL)
CP 13
RET Z
CP 46
JR NZ,INTLOOP

```

We fetch the next digit. If it is 13, the end marker, the whole number has been stacked so we exit. If it is the decimal point, we have finished the integer. If neither of those, it is another digit of the integer part so we loop back to stack it.

```

DECIM INC HL
PUSH HL
RST 40
DEFB STKONE
DEFB RESTACK
DEFB STOMEM3
DEFB DELETE
DEFB ENDCAL

```

Here, we start to process the decimal part. INC HL bypasses the decimal point itself. We then begin by storing 1 in memory 3. Every time a digit is added, the number stored will be fetched, divided by 10, and re-stored - so it becomes .1, .01, .001 etc. on successive passes. We shall get a new digit's true value by multiplying it by this "decimal point position" before adding it to the last value. DELETE removes the 1 from the FPC stack.

```

POP HL
LD A,(HL)
CP 13
RET Z

```

Fetch the new digit. If it is the end marker, exit leaving the complete number - the final last value - on the FPC stack.

```

DECLOOP PUSH HL
LD A,(HL)
SUB 48
LD B,A;(Spectrum omit)
CALL STKBYT

```

Fetch the next digit, deduct 48 from its code to get the digit itself then stack it.

```

RST 40
DEFB RESTACK
DEFB GETMEM3
DEFB STKTEN
DEFB RESTACK
DEFB DIVID
DEFB STOMEM3

```

Convert the digit to floating point form, fetch the last "decimal point position" from memory, divide it by 10, and store it again for the next loop. Leave it on the FPC stack too.

```

DEFB MULTIP
DEFB ADD
DEFB ENDCAL

```

Multiply the digit by its decimal point position, add it to the last value and exit leaving the new last value on the FPC stack.

```

POP HL
INC HL
LD A,(HL)
CP 13
RET Z
JR DECLOOP

```

Fetch the next digit. If it is 13 exit leaving the final last value - the full number - on the FPC stack. If not, loop back to stack it.

Sam users should now add the library routines STKBYT and PRINTFP, and everyone add

```

END EQU $
LENGTH EQU END-START

```

at the end of your listing. Call the routine from your ORG address. You should also save DEC.FPC as another library routine. (All the listing between DEC.FPC and the final JR DECLOOP.)

The FPC can handle strings as well as numbers - the equivalent of LET A\$=B\$+C\$ is done by this short routine.

```

ORG 7777?
ENDCAL EQU 56;(Sam 51)
STKSBYT EQU 10934;(Sam 295)
SETSTR EQU 5633;(Sam 274)
COMCAT EQU 23;(Sam 2)
GETSBYT EQU 11249;(Sam omit)
GETSTR EQU 298 (Spectrum omit)

```

Sam and Spectrum will use different ROM routines to fetch the string parameters so we can print it.

```
START LD DE,STR1
      LD BC,STR2-STR1
      LD A,225;(Sam use the page
number where your string is located
- 0 if below 32768, 1 if 32768-49151
etc.)
```

```
CALL STK5BYT
LD DE,STR2
LD BC,END-STR2
LD A,225;(Sam see above)
CALL STK5BYT
```

We stack the parameters of the two strings involved. Look back to last month for the explanation.

```
RST 40
DEFB CONCAT
DEFB ENDCAL
```

CONCAT makes a new string in the workspace and leaves its parameters on the FPC stack. The new string will consist of the two original ones joined together - the first one we stacked starts the new one.

```
CALL GET5BYT;(Sam use CALL
GETSTR)
```

Spectrum users call GET5BYT, which will give the new string's start in DE and length in BC. Although Sam has GET5BYT, it's GETSTR is better. GETSTR will copy the new string into a 255 character buffer in the system page in slot B, thus avoiding any paging difficulties we might otherwise have. It also gives us the parameters of the buffer string in DE and BC.

```
CALL PRINSTR
RET
```

Call the familiar print routine (below) to print the string.

```
PRINSTR PUSH DE
        PUSH BC
        LD A,2
        CALL SETSTR
        POP BC
        POP DE
        PRLP LD A,(DE)
        RST 16
        INC DE
        DEC BC
        LD A,B
```

```
OR C
JR NZ,PRLP
RET
```

```
STR1 DEFM "The quick brown fox j"
STR2 DEFM "umps over the lazy dog"
END EQU $
LENGTH EQU END-START
```

We don't have to print the new string, of course. If we wanted to keep it more permanently and ensure that later operations did not overwrite it, we could transfer it to somewhere else in memory by using:-

```
PUSH DE
POP HL
LD DE,?????
LDIR
```

The FPC can perform other string-related operations. Here are the literals for some of the more common BASIC string commands.

Command	Spec	Sam
CHR\$	47	86
CODE	28	82
LEN	30	81
STR\$	48	87
VAL	29	84

This has been, of necessity, a brief look at the FPC. If you would like to study it in more detail, or to know exactly how numbers are held in full floating point form, these books will interest you. Some are out of print, but your local library can get them for you. Ask for an inter-library loan if your library does not have a copy.

KRAMER, Steve.
The Spectrum operating system.
Micro Press. 1984.
ISBN 0-7447-0019-1

Includes complete list of Spectrum literals, with clear explanations of how they work. Description of calculator and 5-byte forms of number. The material would be useful to Sam users too, because it casts light on how to use the FPC, and most explanations of instructions apply equally to Sam.

LOGAN, I. & O'HARA, F.
The complete Spectrum ROM
Disassembly.
Melbourne House. 1983.
ISBN 0-86161-116-0

Annotated disassembly of Spectrum ROM. Includes description of all FPC routines and literals. Can be a bit high-flown for the beginner, and the values are all in Hex notation. Very useful once you get to grips with it.

GORDON, B. & WRIGHT, A.
Sam Coupé technical manual, Vers 3.
Available from format, price £12.95 to INDUG members.

Full list of Sam literals, FPC routines, and all the other technical information you need. Vital for Sam users writing machine code programs.

Next month we will begin writing a machine code program which will pull together all that we have learned so far - and add a bit more. See you then.

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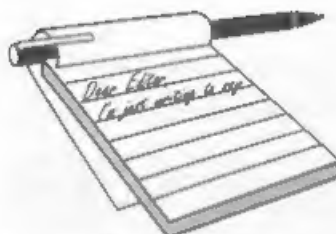
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YOUR LETTERS

Dear Editor,

The last Computer show which did anything for Spectrum was the 4th Alternative Micro Show and Radio Fair at Stafford.

Your proposal sounds like a similar type of get together in Gloucester and I will attend if at all possible.... There is one other point. I know that the QL User Group are having second thoughts about attending so many shows that contribute little to their "machine" and I feel sure that they would welcome the opportunity to contribute to a show in Gloucester which was specifically aimed at 'Sinclairs' (and possibly SAMS) and didn't leave them competing with PCs.

Between you, I believe that you could lay the foundations for a regular show. I'm sure that people like Bill Richardson of E.E.C and many other companies who catered for the Spectrum and the QL would find a better market at such a show.

I wish you the best of luck with the project.

Yours sincerely, Gordon E.Fowles.

If someone could provide a telephone number for the QL user group I will contact them and extend an invitation. More news on the show next month. Ed.

Dear Editor,

Looking at some of the letters and articles in recent issues of FORMAT, it seems that a lot of people have lost touch with the idea of what the Coupé is meant to be about. Dig out some old issues of Crash or YS and turn to one of the early SAM Surgeon or SAM Forum pages. Find MGT's original 4-page advert in SU. Do you remember that great feeling of optimism and hope when the Coupé was first launched? That's what the SAM is about, not smug little reports on the demise of consoles (mind the "e", by

the way) and the Amiga, or people like our friend Mr Perry generally whinging about everything under the sun.

You may argue that that age of optimism is long gone and nothing can be done about the so-called commercial failure of the machine. However, what hardly anyone seems to realize is the fact that the SAM is still a very viable computer, if only we can persuade the big software houses and high street retailers of that. It's no good just one person writing a letter to Psygnosis or WM Smiths - what we need is a joint campaign run by FORMAT, Fred, YS, Zat and all the other SAM-related magazines and user groups. Together, we can prove to the corporate giants that the SAM can cut it with the best of them.

Keep the faith! (I don't believe I just said that).

Yours sincerely, Mark Sturdy.

Well Mark, I for one am still very optimistic about SAM. It has had its problems but it is now in good hands. While sales are fairly low at the moment they are consistent and that's what counts - a dripping tap will fill the bath in the long run. And I did say last month that there would be no more mentions of Mr Perry - so take 1000 lines, "I must not mention that name again".

Big software houses will never produce for SAM, they have even dropped the Spectrum and there are millions of them still in use. But don't despair. New companies are starting up, small one-man-bands just like the big boys were when they started. We don't need the big names, just good original software that will attract people to SAM. The best thing that anyone can do at the moment is spread the word - that SAM is alive and kicking, and a machine with fantastic potential. Ed.

Dear Editor,

Firstly, I must congratulate you on a splendid magazine. Although it is a bit "small", it is still well worth the £12 I paid.

Ever since I got interested in programming on my Spectrum 48K (May he rest in peace. I've got a SAM 512 now. May she live forever!). I've been looking for a magazine that concentrated on the technical side of computing instead of those that just review games. And I have found it. So congratulations to you again!

The main reason I have wrote in, is that I would like to be one of your major program contributors, to which there are a few questions that I really need answering.....

I have a few programs that are developing quite nicely that I would like to publish when I finish them (and if I like them. I'm one of those people who are never satisfied with their own work!). The trouble is that they are being written in machine code (and they are going to be quite BIG!) so that means they are going to be lots of numbers that will need to be typed in by the readers, is this wise?

Another question: What is the maximum size of program (BASIC or machine code) that can be printed?

Does this magazine publish any Pro-DOS (CP/M) programs written in languages such as Pascal and C?

Another problem is that I do not own a proper word processor to write accompanying articles (this letter was written on a school PC!), just an extremely simple text editor that I wrote in BASIC. In this program, all the lines are padded out with spaces. The format is that the first two bytes indicate to the program the size of the file, there are no CR codes so the lines are padded out with spaces (just like the Spectral Writer that came with the Mafadrive). Is the text produced acceptable for your word processors?

I think I should end this letter here. If it got any longer, you will refuse to re-type it in! That's if you are going to print this letter. I hope you do, since this might spark off many more people to send in contributions, not only that, I've

never had a letter printed before!

Yours sincerely, Justin Skists.

Format small!! I will have you know it has regularly printed more pages than any other Spectrum/Sam magazine so there...

Anyway Justin, we would welcome any contribution you would like to make to these pages. There is no maximum size (or minimum for that matter) to articles or programs. In any one issue I would probably not run more than 4 or 5 pages but any long article can be split over several months. Carol's MONEY MANAGER series is a classic case in point. Machine code does present more problems. But provided a Basic 'POKE' program is written with DATA statements that are not too long and provided there is a check-sum (preferably to each line) then I will consider anything. I look forward to seeing some of your work soon. Ed.

Dear Editor,

In the May issue of FORMAT I read the news about the launch of your Science Fiction magazine. Since I have long been a SF (as well as a computer) addict, it sounds like a great idea to me and I'd gladly help you in any way I can.

Perhaps the idea of having the editor overseas puts you off, but anyway I've got the time, the interest and a brand new 486 (running Windows) by my side. So please drop me a line if you think that I could be of any use.

Yours sincerely, Mattias Danielson.

'VOID', as the magazine will be called, is still very much an idea. Being overseas would cause some problems but if I can't find someone nearer home then I won't rule you out.

It does appear that the idea of a SF mag is popular and I would really like to hear from any budding author out there. Ed.

Dear Editor,

Your May editorial was extremely interesting, especially the part of the proposed quarterly SF magazine. I

have often tried my hand at the odd masterpiece and have generally been quite pleased with the results. I should add that these have been historically orientated to Victorian London, but when you've grown up with the Star Wars trilogy and the whole craze of films that appeared around the late 70s early 80s, its hard not to be a fan in some way.

I would love to help or take part in some way and would be grateful if you could furnish me with further details.

Yours sincerely, Toby Cooley.

Thanks Toby, I would love to talk to you but you didn't give a phone number. Give me a ring one evening and we will chat about it. Ed.

Dear Editor,

1. Please put me on the list as interested in the proposed meeting in the Gloucester area.

2. Will there be any Spectrum/SAM dealers present.

3. I am given to understand that NFI have stopped making membranes for the Spectrum, Plus, +2, etc., and supplies are drying up. When they go the Spectrum goes - unless you have either a SAGA or similar keyboard and when that goes, etc., etc., BG Services still has rubber key membranes but not the Spectrum+. Co-ordinated action is going to be needed by all the Spectrum-orientated groups, etc., and as FORMAT is the only commercial organization in the business could I suggest that you take the initiative in contacting the others? 'OUTLET and the Discovery Club spring to mind. I'm told that the Dutch user group is still in being and there is said to be a stock of membranes over there. Any information?

I am looking for a few INTERFACE 1s for a project using Spectrums on a net. If any FORMAT readers have one they no longer use I would be pleased to hear from them. Microdrives not needed, my telephone number is 0273 844530.

Last but not least, to save time and for mutual benefit, I enclose a cheque to keep the FORMATS coming. I looked back through several issues to find

the current rates without success so hope I'm right for another year. Hope to see you in Gloucester.

Yours sincerely, Paul King.

As I said earlier, more news on the gathering next month, but I hope there will be several companies present.

Keyboard membranes are being looked into but they seem to want very large quantities produced. In the meantime we have someone looking at producing an add-on keyboard for Spectrum users. Ed.

Dear Editor,

Once again thanks for another great issue of FORMAT (June 93). It's very encouraging to get the feedback from my Printer Control Codes article in the April issue. It's nice to know that it has been of some help to other Spectrum/SAM users. I know how they feel! when having spent their hard earned reddie on a nice new printer it refuses to perform. I spent many hours learning by trial and error due to the serious lack of available simple information.

On the subject of AGE the only comfort that I can offer R. Chowdhury is that I am older than he(?) is - 49 next birthday so don't despair, and as the old saying goes 'you're only as old as you feel' - and that varies considerably!!!

Finally - shame on all those who didn't spot the April Fool (FOI PROALL) in the April issue although it was very, very convincing. Mr J. Gobiet (Big Joke) must have been very surprised at all his unexpected mail!!!

Yours sincerely, John E. Redfern.

It was a good article John. Ed.

Dear Editor,

I always look forward to getting your excellent magazine and I hope you will continue it for many years.

I'm just wondering what became of my letter sent to you 17th April 1993, (copy below here). I thought you were interested in every news on the Spectrum scene, or is it the post

British/Denmark again.

I know it is too late now for members of **FORMAT** to get to the Summer work out, but that is just a pity for the members.

Here is the original letter.

I'm writing, because I have been ordering the clip art collection from "Teachers Pet software". I'm sad to say, He's not in Spectrum business anymore. Therefore I'm asking you if you or any of your readers know if there is another publisher of clip art. If not I will be very pleased if you know someone who has clip art for sale.

I have some news that may be of some interest. The Danish computer club "Sinclair Freakeren" is having a summer workshop the 23rd-25th July in Silkeborg. It is open for everyone interested. There will be workshops and the categories are: Spectrum, QL, SAM, games, C programming, and what else we can find out. If you are interested you can contact:-

Preben D.Sorensen,
Jagertsgade 128 I,
8000 Arhus c.
DENMARK. Tel. 010 4586 1914 90.

Yours sincerely, Preben D.Sorensen.

Space, the final frontier... If I had twice the space I could still fill it with letters and I'm sorry to say that some just don't make it. Still its not too late to pass on your original news.

Normally the letters page gets done around the middle of **Format's** editing cycle. The last pages are the editorial and the news pages. The more notice we have of any events the more chance there is of getting something into print. As to Teacher's Pet, I will try and contact them. Ed.

Dear Editor,

Last week I finally got around to typing in the 'SUPER GOLF' listing you printed in the December issue. I found it a very enjoyable game, and well worth the effort. However, on the SAM there are one or two small differences in addition to the extra line 10 already quoted, which may be of

interest to other SAM users. I list them as follows:-

Lines 1000 and 9530:- Change USR "A" to UDG CHR\$ 144

Line 2010, item 7:- : LET K=ABS(K-2+RND*4):

Line 2110:- STEP can not be used as a variable, just add another P, making it STEPP

Line 5140:- Change STEP to STEPP, as above.

Line 9050:- After PRINT T\$" add :PALETTE:PRINT

Line 7000:- Between PRINT and B\$, add PEN 7;

The last one is not necessary, the white just shows up a little better on the green background.

As I am not a programming expert, I don't think I can manage to improve or add to the game as suggested. But I am sure there are many others who can and will, using SAM's improved capabilities. I look forward to that, as indeed I look forward every month to receiving my copy of **FORMAT**.

Yours sincerely, Wilf Smith.

I have not had time to study your changes in detail but thanks for the effort Wilf.

So far I have been very disappointed with the response on Super Golf. Lots of people typed it in (I know that from phone calls) and several dozen lazy people purchased the disc we offered. But few (well two really) have made any attempt at improvements. Come on programmers - show your skills.

By the way if anyone writes a better Golf from scratch - FANTASTIC. But to those of you who make improvements could you just list the lines you change, there isn't room in **FORMAT** for me to list the whole program again. Thanks. Ed.

Letters may be shortened or edited to fit on these pages.

This is YOUR letters page so it is up to you, our readers, to fill it. Keep letters as short as you can so we can fit in as many as possible.

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